

REMARKS

In response to the Patent Office Action mailed September 23, 2004, claims 13 to 22 have been cancelled and new claims 23 to 35 have been substituted. Claims 13 to 22 were rejected by the Examiner as "clearly anticipated" by the disclosure of U.S. Patent No. 6,050,499 of *Takayama, et al.* under 35 U.S.C. § 102(b). Although the Applicant respectfully traverses the rejection by the Examiner of claims 13 to 22 for the reasons set forth below, the Applicant respectfully submits that claims 23 to 35 clearly patentably distinguish over the *Takayama, et al.* patent as set forth below.

Contrary to the finding by the Examiner that the *Takayama, et al.* patent discloses a "steering air ring 3" having inner holes 30 and outer holes 4 which are "capable of performing the method steps as claimed," *only the outer holes 4 are shaping air holes*. The inner air holes 30 are *used only during the washing or purging operation*. Thus, it would not be possible using the rotary spray head or atomizer disclosed in the *Takayama, et al.* patent to generate different paint spray patterns with the air shaping ring 3.

As set forth in the specification of this application, "One general problem in the utilization of atomizers is that atomizing cones of different width are required for coating different workpiece regions." When "coating large areas, bell dishes with a larger diameter are used and the width of the spray jet (defined as SB 50%, i.e., as the width at 50% of the maximum layer thickness of the individual profile) is adjusted to a value of approximately 300-500 mm. Smaller bell dishes are used for detail coating and interior coating processes, as well as for coating attachments and other small components, such as mirrors, decorative strips and shock absorbers, where the width of the spray jet is usually adjusted to a value between 180-300 mm. When using smaller or narrower spray patterns, the application efficiency, which is defined as the ratio between the coating material that is sprayed and the coating material that is precipitated, is higher than when using wider spraying patterns. This makes it possible to

significantly reduce the costs, as well as the consumption of coating material.” (Paragraph [0006]). Further, if the coating process cannot be interrupted in order to replace the spraying head, high efficiency and uniform coatings can be achieved only by comprehensive coating of a workpiece with a wide and narrow spray jet adjustments. “Until now, it has not been possible to optimally adjust the spray jet to both of the above-mentioned widths with the steering air of a given atomizer.” (Paragraph [0008]). The atomizer and method of this invention solves this problem by utilization of a gas shaping ring located opposite a generally frustoconical surface of a bell dish including a plurality of circumferentially spaced inner gas shaping holes and a second plurality of circumferentially spaced outer gas shaping holes surrounding the first plurality of circumferentially spaced inner gas shaping holes, then directing shaping gas under pressure through either or both of the gas shaping holes to generate different paint spray patterns as discussed further below.

The rotary atomizer disclosed in the *Takayama, et al.* patent states that “the sprays of paint particles are shaped into a desired pattern by shaping air which is spurted out through the respective shaping air outlet holes 4.” (Col. 12, lines 52 to 55). However, the *Takayama, et al.* patent is primarily concerned with washing or purging the bell cup 13 because of the configuration of the bell cup and the close or tight passages provided by the design of the atomizer as best shown in Figure 2. Only during the washing or purging operation is air supplied both to the shaping air outlet holes 4 and the “assist air outlet holes 30,” such that “thinner can be pushed against the outer peripheral surface 13H of the bell cup 13 most effectively in terms of improvement in washing efficiency.” (See col. 15, lines 7 to 14).

The washing operation is described in detail in column 14, beginning at line 7, as follows:

During the washing operation, air is supplied to the shaping air outlet holes 4 from the shaping air supply passage 5 to spurt shaping air toward the outer peripheral side of the rotary atomizing head 12 through the respective shaping air outlet holes 4. At the same time, air is supplied to the assist air

supply passage 31 from the pressurized air source 36 through the air feed pipe 35, and joined by exhaust air from the air motor 8 before it is spurted out through the assist air outlet holes 30 in the direction between the fore ends of the spread front portion 19B of the annular guide 19 and the outer peripheral surface 13H of the bell cup 13.

The thinner which has come out onto the outer peripheral surface 13H of the bell cup 13 normally tends to scatter away in radially outward directions under the influence of centrifugal force resulting from high speed rotation of the rotary atomizing head 12, but instead the thinner is pushed against the outer peripheral surface 13H of the bell cup 13 by the actions of assist air, which is spurted out through the respective assist air outlet holes 30, and shaping air which is spurted out through the respective shaping air outlet holes 4. As a result, the thinner is guided toward the front end of the bell cup 13 along the outer peripheral surface 13H, washing away deposited paints from fore end portions of the outer peripheral surface 13H of the bell cup 13.

The washing operation is further described in the *Takayama, et al.* patent in column 14, beginning at line 60, as follows:

Further, by the use of shaping air spurted toward the rotary atomizing head 12 from the shaping air outlet holes 4 in combination with assist air spurted out from the assist air outlet holes 30 which are provided radially on the inner side of the shaping air outlet holes 4, the thinner is pushed strongly against the outer peripheral surface 13H of the bell cup 13 to improve the washing efficiency for deposited paint all the more.

Thus, the *Takayama, et al.* patent does not disclose or suggest a steering gas ring located opposite a bell cup having a generally conical outer surface which includes a first and second plurality of circumferentially spaced inner and outer gas shaping holes wherein gas is supplied to either the first or second plurality of holes during painting to generate *different paint spray patterns*.

New claims 23 to 32 are directed to an atomizer for the series coating of workpieces and new claims 33 to 35 are directed to a method for the series coating of workpieces. Claim 23 claims an atomizer including a bell dish having a generally conical outer surface and a longitudinal rotational axis and a steering gas shaping ring adjacent to and opposite the generally conical outer surface of the bell dish including a first plurality of equally circumferentially spaced inner gas shaping holes defined around a first circle directing shaping

gas against the generally conical outer surface of the bell dish "during application of paint by said atomizer," and a second plurality of equally spaced outer gas shaping holes defined around a second circle having a radius greater than the first circle "during application of paint by said atomizer *to generate a narrower paint spray pattern* than a paint spray pattern generated by directing shaping gas through said first plurality of equally circumferentially spaced inner gas shaping holes." (Emphasis added).

As set forth above, the *Takayama, et al.* patent does not disclose an atomizer which is capable of generating different paint spray patterns depending on whether shaping air is directed through the first or second plurality of gas shaping holes. It should also be noted that the shaping air in the *Takayama, et al.* patent directs shaping air through the holes 4 during painting and such holes do not direct shaping air against the back side 13H of the bell cup 13 because the diameter or radius of the air shaping holes 40 is greater than the diameter of the bell cup 13. Further, as set forth above, the inner air holes 30 are not used during application of paint, but only during washing with thinner or solvent to push the solvent against the back side 13H of the bell cup 13. Thus, the Applicant respectfully submits that claim 23 clearly patentably distinguishes over the *Takayama, et al.* patent.

Claim 29 further defines the second plurality of circumferentially spaced outer gas shaping holes as having a diameter less than the diameter of the bell dish to direct gas against the conical outer surface of the bell dish at a radius greater than a radius of the first plurality of gas shaping holes which is not disclosed in the *Takayama, et al.* patent and further states that the first and second gas shaping holes are "each connected to a source of gas under pressure permitting independent direction of shaping gas through either of the first or second plurality of gas shaping holes to generate different paint spray patterns." As set forth above, the *Takayama, et al.* patent does not disclose or suggest these important features of the atomizer of this invention.

The claims dependent upon claims 23 and 29 define further features of the atomizer of this invention which are not disclosed in the *Takayama, et al.* patent. For example, claim 25 specifically recites that the first plurality of equally circumferentially spaced inner gas shaping holes extend parallel to the longitudinal axis of the bell cup, which is contrary to the teaching of the *Takayama, et al.* patent, wherein the solvent assists gas openings 30 are defined at an acute angle to the longitudinal axis to push solvent against the back surface of the bell cup as discussed above. Claim 26, which is dependent upon claim 23, further recites that each of the first and second gas shaping openings "are independently connected to a source of gas under pressure to independently control the flow of gas" through the first and second gas shaping openings "to independently achieve different paint spray patterns," similar but not identical to independent claim 29. Again, this is contrary to the teaching of the *Takayama, et al.* patent.

As set forth above, claim 33 is directed to a method of series coating of workpieces which includes positioning a bell dish in the atomizer having a generally conical outer surface and a longitudinal axis and locating a gas shaping ring opposite the generally conical surface having a first plurality of circumferentially spaced inner gas holes and a second plurality of circumferentially spaced outer gas shaping holes surrounding the first plurality of circumferentially spaced inner gas shaping holes, wherein the method includes "directing paint under pressure against said bell dish to apply paint to a substrate *and simultaneously directing shaping gas under pressure through said first plurality of circumferentially spaced gas shaping holes* to generate a first paint spray pattern," and directing paint under pressure against the bell dish and *simultaneously* directing shaping gas through the second plurality of circumferentially spaced outer shaping holes to generate a different paint spray pattern. For the reasons set forth above, the *Takayama, et al.* patent does not disclose or suggest the method of claim 33.

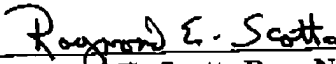
Claim 34, which is dependent upon claim 33, more specifically recites that the method includes directing shaping gas through the second plurality of circumferentially spaced gas shaping holes "to generate a narrower paint spray pattern than a paint spray pattern" generated by directing shaping gas through the first plurality of inner gas shaping holes. Finally, claim 35, which is dependent upon 33, more specifically recites the method of this invention which includes "directing shaping gas through only said first plurality of circumferentially spaced inner gas shaping holes to generate a first paint spray pattern, then directing shaping gas through said second plurality of circumferentially spaced gas shaping holes" to generate a second pattern. Again, for the reasons set forth above, the Applicant respectfully submits that claims 34 and 35 patentably distinguish over the *Takayama, et al.* patent.

The Applicant respectfully submits that the prior art does not disclose or suggest either an atomizer or method which permits the adjustment of the width of the paint spray pattern without shutting down the application of paint and replacement of the bell dish or the atomizer. The Applicant therefore respectfully requests allowance of claims 23 to 35 for the reasons set forth above.

Although it is believed that no fee is due for the filing of this Amendment, the Commissioner is authorized to charge our Deposit Account No. 08-2789 for any additional fees or credit the account for any overpayments regarding this Amendment. Further and favorable reconsideration of the outstanding Office Action is hereby requested.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the attached Amendment is being facsimile transmitted to Examiner Steven J. Caney at the U.S. Patent and Trademark Office at facsimile number (703) 872-9306 on this 10th day of December, 2004.


Tracy L. Smith

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